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TANITARY __ _ 1055 Vol 23 No. 1

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WI BROADCASTS

All Amateurs are urged to keep these frequencies clear during, and for a period of 15 minutes after, the official Brandensis.

VK2WI: Sundays, 1180 hours EST, 7148 Ke and 2000 hours EST 50 and 144 Mc. No frequency checks available from VKZWA Intrastate working frequency, 7125 Kc.

VK3WI: Sundays, 1130 hours EST, simultan-eously on 3373 and 7146 Ke., 51.018 and 145.25 Me. Intrastate working frequency 7135 Ke. Individual frequency checks of Amateur Stations given when VK3WI is on the air.

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VK6WI: Sundays, 0530 hours WAST, on 7146 Kc. No frequency checks available.

VK1WI: Sundays, at 1000 hours EST, on 7146 Ke and 148.5 Mc. No frequency checks are available.

AMATEUR RADIO

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EDITORIAL

N.Z.A.R.T. CALL SIGN BOOK, 1954

We have just received our copy of the New Zealand Association of Radio Transmitters' "Break-In" Call Book, 1954, issue, and wish to record our appreciation of this very fine effort by the Editorial Committee of the N.Z.A.R.T.

To many readers, this publication will be just another very useful aid to Amateurs in pursuit of overseas contacts, but to those who have shared the hard work of producing the Australian Call Book, such an effort is fully appreciated and merits our congratulations to those concerned

No doubt the Editorial Committee and other officers of the Association will confirm that the risks involved and the effort expended, was well worth while, if the Call Book proves of assistance to their fellow Amat-

In addition to a comprehensive list of N.Z. calls, covering the various districts of New Zealand, the book lists the names and addresses non-transmitting members and also gives several useful operating hints. A list of DX C.C. countries is included and also a country prefix list, together with many interesting deawards, etc.

Useful details of Standard Frequency Transmissions from WWV and also local Amateur Frequency and also local Amateur Frequency Transmissions are given and also in-formation is supplied on the working of the QSL Bureau, Amateur Fre-quency Allocations, Emergency Corps, Official Broadcasts, Official Observer Station Service, and Branch Secretaries' names and ad-

The Wireless Institute of Australia has arranged to handle the sale and distribution of this Call Book and commends it to all Australian Am-ateurs as a valuable addition to their libraries.

It seems pertinent to us that our readers should be reminded that of what can be done by a live association of Amateurs, who have concentrated their efforts through the N.Z.A.R.T. in the production of this splendid issue.

We believe that the Amateur in all countries is best served by the establishment of societies controlled by individual franchise, the fruits of whose efforts are generally seen in an improvement of Amateur Radio facilities and operating conditions such as we have outlined in this latest evidence of progress.

FEDERAL EXECUTIVE.

THE CONTENTS

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COMMAND CONVERSIONS FOR FIVE BANDS

BY J. K. HERD. VK3JK

BY now we are all very familiar with those popular pieces of disposals equipment known as the BC450/SCR274N/ARC5 series of transmitters and receivers. It is with the transmitters that this article will deal and it is to be hoped that someone who has had experience with the receivers will describe their alteration and uses later.

Of course a great deal has been written regarding the transmitter conversions in "CQ," "QST" and other American journals, but to cull and collate the relevant details is quite a job, even if they were all available for us

Some of the following ideas were obtained from two "CQ" articles, one by Lt. Paul H. Lee, W4RXO (May, 1952) and the other by Herb. S. Brier,

to peruse

W9EGQ (February, 1954). The main frequencies we wish to cover are 3.5, 7, 14, 21 and 28 Mc., and a separate transmitter for each of and a separate transmitter for each of these bands can be acquired by modi-fying the 4 to 5.3 Mc. unit (BC457A). However for the 7 Mc. and higher fre-quencies, the 5.3 to 7 Mc. or preferably 7 to 9.1 Mc., entail less work.

80 METRES Firstly for 3.5 Mc. For this band use the BC 457A. It is desirable to rewire the filaments for 12 volt operation by putting them all in parallel. But, before we do so, it will be simpler if we take out all the unnecessary bits and pieces as our first job. Now for the screw driver and small side cutters!

Take off the top cover and bottom inductance and its associated relay and supports and carefully put the inductor to one side. Then turn the unit over and examine the chassis interior careand examine the chassis interior care-fully, noting that the only wiring needed will be that for p.a. plate, p.a. screen, osc. plate and the flaments. Take out all wires associated with the small relay in the cathode circuit and small relay in the cannote circuit and the relay itself, as also the wires that run up to the antenna relay. The method of altering the filament wiring from series (for original 24 volt supply) to parallel for the proposed 11.3 to 12 volts, is quite obvious, but we must remove the resistor in clips on the rear wall as well as the quarter watt con-nected between pins 2 and 8 on the magic eye (1629).

Having dealt with the filaments and redundant wiring and earthed the 1625 cathodes, proceed to remove the shield can covering the osc. coil and padder condenser, topside. With the bristo spanner, release the grub screws on the locking washer attached to the shaft and drill a 1" hole in the can so that this shaft can be operated by a screw driver to reset the oscillator frequency. *4 Murdoch Road, Wangaratta Vie.

By increasing the capacity in this condenser, the oscillator will go down to about 3.2 Mc. without further ado. The station receiver can be used for this purpose. Now unlock the grub screws on the p.a. padder condenser, so that it may be resonated with the oscillator frequency. The rotary link inside the p.a. tank coil now has one side earthed and the other can be run to the antenna terminal, or alternatively a co-axial connector can be used instead with a piece of co-ax running therefrom to the rotary link. This is really preferable.

If it is desired to replace the original 7-pin female plug on the back drop of the chassis with a 5-pin valve socket. the chassis with a 5-pin valve socket, the original plug is removed by using a sharp screwdriver to release the turned over edge on that plug so that it can be pushed out. Then file the hole to fit the new socket and connect the wiring to it as follows:-

Group the B minus, earth and one filament wire to one pin, and on the other four solder the other filament (unearthed), p.a.h.t. plus, screen p.a. h.t. plus, and osc. h.t. plus. Having first temporarily replaced the oscillator shield can and set the padder, again remove the can and relock the grub screws on

both this and p.a. padder unit. Replace the can and its screws, the bottom plate and upper cover; it is now ready to go on 3.5 Mc

If one wishes to plug in a grid current meter or a key, use a phone jack or a pair of insulated pin jacks placed in front of the neutralising condenser on the side wall of the chassis. One side goes to the grid leak of the 1625s and the other is earthed. By using a 90 volt battery or a fixed bias supply, blocked grid keying is the ideal method for these little units. Up to 750 volts can be used for c.w. and 600 volts for phone, without danger of flashover in condensers.

40 METRES In this case preferably use the 7 to 9.1 Mc. unit or the 5.3 to 7 Mc., to save extra work other than the necessary removal work other than the necessary removal of surplus pieces and wiring as de-scribed above, and the re-wiring of filaments. The 53 to 7 Mc. unit needs only re-setting of the padders to bring it from 5.3 up to 7 Mc. as further treatment, but the 3 to 4 Mc. or 4 to 5.3 Mc. units need extra attention in either of two ways.

One is to install a 12A6 in the crystal socket and a coil in the 1629 socket, either slug or condenser tuned, for

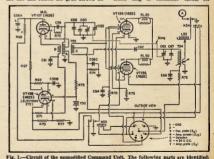


Fig. 1.—Carcuit of the unit CSSA. CISE, CSSC-0.65 wF. CSS-0.00013 uF. C60-Master escillator padding. CSI-0.006 uF. CCI-Fixed neutralising. CSI-Master socillator tuning. CST.—Power amplifer padding. CSS.—S pF. CSS.—S pF. ESS.—Transmitter selector relay. LSS.—Antenna leading coll. EST. RTS.—ESS.—On chuns. ESS. RTS.—CO chuns. Bris are Helli R70-1,000 chms. R71-126 chms. R73-876 chms. R77-876 chms. E78-81 chms. E78-81 chms. E78-81 chms. E78-91 chms. E78-0 scillator cells. T51-Amplifer cells. Y50-Crystal unit. Cot-Master escillator tuning Cot-0.002 nF. Cot-Power amplifier tuning. Cot-0.01 nF.

doubling purposes. In this event we remove the neutralising condenser on the side wall and place it in the iunk box, for it was actually found unnecessary on any of the conversions—there sary of any of the coversons—here being no sign of instability on any of the units. Remove the wire going to C58C and R74 from the base of the osc. coil and re-solder it to the pin, which was previously connected to the neutralising condenser. Remove the wire going to the 1625 grids. From the pin on the osc. coil base to which it was pin on the esc. coil base to which it was connected, run a wire to the grid pin on the 12A6 socket. Having rewired the latter tube as a doubler to 7 Me., couple it to the 1625 grids through a 100 pF. mica condenser and run a 15,000 ohm one watt resistor to one side of the beforementioned key jack.

The other method-alteration of the The other method—alteration of the cosc. coil—is probably the easier. Remove the appropriate shield can and attack the osc. coil winding in this fashion. From the top of the coil remove turns from the heavy winding leaving 38 above the cathode tap, and from the bottom of the winding remove sufficient turns to leave 6 below the

cathode tap

word of warning here! It will be noticed that winding B in the original circuit (see Fig. 1) is made with very fine s.c.e. wire, so be cautious in your labours below the cathode tap! If this is broken inside the coil former, untold trouble is caused and patience is needed to replace it. I know, it happened to me. Cut this wire a full turn away from the hole through which it disappears, then remove sufficient turns to bring it level with the heavy winding (A in Fig. 1). Bare both cut ends very carefully and neatly splice and solder. The oscillator can be brought to 7 Mc. with the padder.

Turns are removed from the p.a. tank its padder and variable condensers. Leave 81 double spaced turns on coil If it is desired to still use the magic eye, replace the tap to R73 one turn up from the bottom of the osc.

coil winding

15 METRES We have a wide choice for this frequency. The casiest is to use a 7 to 9.1 Mc. transmitter and proceed as we did for 3.5 Mc. When all this is done, turn the dial to 9.1 Mc. and, by re-setting the oscilla-tor to tune to 10.725 Mc., we can double in the final. In this case, cut the lead to the stator

of the p.a. geared variable condenser. remove the locking device from the p.a. padder, fit an extension shaft and knob to it, and remove turns from the p.a. coil leaving 41 double spaced turns and we are ready to go when a 50,000 ohm grid leak is substituted for the 15,000 ohm one. It is better to use a 12A6 doubler one. It is better to use a 12A5 doubler as described earlier and drive the p.a. as an amplifier on 21 Mc. using the 15,000 ohm grid leak in this case, preceded by a 2.5 mH. r.f. choke. Again we may use any of the other units by attacking the osc. coil winding as before to enable us to bring it to 10.725 Mc. as its upper limit

In the doubler plate tank a 50 pF. midget condenser tunes a close wound midget condenses tunes of 20 gauge enamel wire, mounted on two pins of a cut down tube base. About 20 turns will resonate on 21 Mc.

Fig. 2.—The 28 Mc. conversion is somewhat similar to the 14 Mc. Transmitter.

20 METRES Use any of the units by altering the osc. coil in the case of the 3 to 4 Mc. or 4 or 5.3 Mc. jobs and re-set the chosen one to cover the required spectrum on 7 Mc. out all the wiring and small resistors associated with the crystal and 1629 20 ohm resistor in the oscillator plate lead. Now proceed to add a doubler as before, using a similar condenser and 6-turn coil wound on a valve hase Disconnect the p.a. variable condenser and cut down the p.a. tank coil to 54 double spaced turns. The rest of the modifications are as previously set out. This job will really delight you with its performance.

10 METRES There is a good deal more to be done with this one. After proceeding as for pre-vious units (14 Mc.) remove the surplus wires, etc., and rewiring the filaments in parallel, take out the variable tuning condensers and their worm drive in toto. by the following procedure:

Remove the knob on the vernier tuning control, lock nut on the centre of the graduated dial, as also the frequency locking knob and the clamping device associated with this latter. Remove the p.a. padder condenser com-pletely and take out the mounting screws holding geared variables. These condensers can now be juggled right out

of the chassis.

We now proceed to remove plates from the condensers at this stage, but, once more, be careful of the method of attack. The rotors move in ball bear-ings which are filled with small spheres 1/16" diameter. Undue pressure or incautious application of the pliers will dislodge the rear end of the rotor and then the fun begins with the retrieving of these tiny bearings from the floor (if they have not already rolled into some place where they defy all attempts at discovery)—again I know, that's the reason of the warning.

Now remove all but six rotor and five stator plates in the p.a. variable condenser. When this is done, unlock and remove the gear wheel engaging the worm drive on it from this condenser shaft and drill a #" hole on the side of the chassis to accommodate a shaft and knob so that independent tuning with this condenser is possible.

The oscillator variable has its rotor only dealt with and here take out all but three moving plates. The associates padder above has four rotor plates removed before the shaft is unlocked. moved before the shaft is unlocked. Proceed now to operate on the osc. coil in a similar fashion to before, but this time leave only 1 turns above the cathode tap and four below it. Remove B winding turns (Fig. 1) until level with the heavy winding as before. It is pos-sible to put the oscillator now on 14 with comparable stability to that on 3.5 Mc. Instal a 12A6 doubler, as already set out, with a 50 pF. variable and about eight turns of 16 gauge tinned wire | diameter spaced to one inch

Couple the plate of the 12A6 to the 1625 grids by a 30 pF. ceramicon, run a 2.5 mH. r.f. choke and 15,000 ohm grid leak as before, but shunt the choke with a 20,000 ohm one watt resistor and from the junction of the r.f. choke and resistor connect a small 0.001 uF, mica condenser to earth. Use two porcelain feed-through insulators to support the pa. coil above the chassis, having discarded the original p.a. tank coil. The carded the original p.a. tank coil. new coil consists of six turns of 12 gauge bare copper wire 1" diameter spaced to Connect the h.t. plus to one end of the coil and by-pass it with the original condenser C66 to earth. Retrieve the plate clips and parasitic chokes from the discarded p.a. tank condenser to connect the 1625 plates to the other end of the coil with these. Now the oscillator can be set on 14 Mc. and the doubler tuned to 28 Mc.

In all cases a grid current of 5 Ma. is the optimum and, if necessary, cut it back when using a 12A6, by increasing the value of screen resistor of that tube Oscillator plate voltage should preferably be stabilised at 210 volts, under which condition the frequency is rock The condenser tuning doubler coil, when used, fits on the side wall of the chassis, below the 1629 magic eye socket between the back drop and the oscillator variable condenser.

6 METRES A much more involved operation was performed for this conversion. The oscillator being placed on 16.670 Mc. and a 12A6 used as a tripler driving the 1625s as push pull amplifiers. The tripler is link connected by a co-axial line to an aperiodic

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grid coil and adjusted for 6 Ma grid drive This ich works as far as tripler output is concerned on 6 metres, but he it is completed and operating, it will be the subject of a senarate erticle

OPTIONAL CRYSTAL CONTROL ON SO OP 40 METPES

A plug-in adaptor (Fig. 3) is made which can be placed in the 1626 socket, and this tube is used then as the c.o. without disturbing the v.f.o. feature of the unit. V.f. control can be reverted to by removing the adaptor and re-placing the 1628 when we wish to Should we have been lucky enough to get the resonating crystals with our transmitters, we can use at least the holder and nerhans the crystal as well can be reground for 3.5 or 7 Mc With a hack saw carefully cut round the sealing can just above the base of

the crystal holder and remove the can. This will disclose an excellent holder on an octal base This can be used again if it and its crystals are considered suitable when altered The adapter is constructed as shown in Fig. 3 from scrap aluminium. An

metal tube, is fitted to the bottom of this unit and an octal socket placed so that the 1828, when inserted, lies over the space where the crystal and magic the space where the crystal and magic eye were situated (latter tube is used is removed for crystal operation). A suit-able crystal socket is fixed to the adaptor in a position where it will not interfere with cuter ton cover when letter is replaced.

If, when operating phone with the 80 and 40 metre units, frequency modulation is noticed or suspected, a buffer stage can be inserted in a fashion simllar to a 12A6 doubler stage, except in this case a 2.5 mH. r.f. choke is used to replace the tuned circuit in the plate. The buffer doubler in the other conversions will prevent the oscillator from being affected in this manner.

Depending upon the input used in these transmitters, an appropriate mod-ulator can be employed for modulation of the plates and screens of the 1625s at 255 volts.

It is suggested that the circuit shown in Fig. 4 of the power supply be em-ployed. By this means extreme variaployer. By this means exceed the trions in screen voltage can be avoided when employing c.w. The use of a dropping resistor from the p.a. plate supply to feed the screens is not advocated for telegraphy.

ANTENNA COUPLER

The antenna coupler here uses some of the discarded pieces from the various units. The 80 metre coil from the 3 to tune the antenna has turns removed so that the optimum antenna current for a particular frequency on 80 metres obtained. A coil from the 5.3 to 7 Mc. or 7 to 9.1 Mc. units can be cut down and double spaced to parallel tune the and 10 metres air wound coils are used

The all-band antenna here consists of a 66 feet flat top, centre fed by an open wire line 42 feet long and a suitable Coupler, using disposal gear, is used.

Band changing with the units described, and the above coupler, is merely

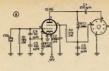




Fig. 3.—This adapter may be used with any Command transmitter by following any command transmitter by following the instructions given in the text. A partial structural view is shown in "B" and a schematic (parts list below) is shown in "A."

http://doct.org/ http:/

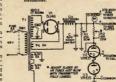


Fig. 4.-Parts list and wiring schemat of a power supply suitable for use with the Command set transmitters. Although the rectifier tube is slightly overloaded, no damage should result if the primary of the transformer is fused. The oscil-lator voltage must be regulated for v.f.o. operation.

V.L. operation.
T.—Tweer instructures, 004-4050, 200 Ma.
CL-4.5 h. 200 Ma.
CL-4.5 h.

a matter of seconds and we have 100 a matter of seconds and we At this station, return to the old order of transmitters, which were in a constant state of alteration would not be contemplated under any consideration apart from the tidy and simple appearance of the set-up. It is really ideal for the man with limited space for his gent.

MULTLRAND ANTENNA

In closing here is an idea for a four band antenna that is worth trying. Flat top 137 feet 8 inches long, and fed with 300 ohm line, 46 feet 6 inches from one a fairly accurate match on all four bands without accurate impedance matching with an antenna counter

The following is a comment by Ed-mund H. Marriner, W6BLZ, from "CO" of March, 1954.

of March, 1954.
"No graphs and no theory, but an antenna that works on 80, 40, 20 and 10 metres. I have often wondered why someone doesn't publish a handbook with antenna dimensions worked out. antenna without plowing through a lot of formulae and graphs.

"Here is an antenna worked out by W5LFM so that it can be fed on 80, 40, 20 and 10 metres with the 300 ohm point for the feeder at the same place for all bands. This lends itself to the

use of 300 ohm twin lead. On 80 metres, the half wave antenna has a high angle of radiation This is good, as many readers are interested in 200-300 mile contacts. On 40, 20 and

10 metres the angle decreases and comes out about right for DX on each hand "This antenna is a version of the old single wire off-centre fed Hertz. It is fed with 300 ohm twin lead. The an-tenna must be cut to 137 feet 8 inches long. The antenna is fed at a point 46 feet 8 inches from one end. An insulator is inserted and the 300 ohm twin lead fastened and taped with electrical plastic tape. The antenna is made 137.7 feet specially so that it falls in the middle of the ten metre band at about 28.4 Mc., which is the most critical band, It is very broad tuning on all other

"There are several ways to counte the antenna into the transmitter. If a parallel tank is used, adjustment can be made by simply moving the link in and out. If a 50 or 70 ohm low-pass filter is used, it will be necessary to add a set up to match to the 300 ohm line. "I have found that with this antenna there is less t.v.i. than when using endfed Zepps where there is a large circulating current in the feeders.
"Near the ocean it is best to use No.

12 plastic house wire for the antenna. This solves antenna wire corrosion problems. The antenna will last much longer

"Do not use rope to support the antenna or you will wake up one morning and find the twin lead wrapped around the antenna due to shrinkage of the rope A swivel does not help very much. is best to use wire to support the antenna and bring the wire right up to the pulley. The supporting wires should be broken-every several feet with egg insulators so as not to unbalance the antenna."

WOY WOY FIELD DAY OF THE N.S.W. DIV. W.I.A.

The value of these organised Field Days has been evident this year as sibly never before and this 1954 Field Day at Woy Woy attracted a large gathering of Amateurs, their wives and families, not forgetting the XYLs from Sydney and Newcastle for the main part; Arthur 2ZP, journeyed from In-verell, but it was found that the road traffic was not so severe as in previous years and all appeared to make fast times on the trip.

The following attended: 2ASW, 2HZ, 2VC, 2YA, 2ARF, 2LX, 2KR, 2AKR, 2AKR, 2ABV, 3CH, 25C, 2FC, 2AGO, 2XT, 2GO, 2ASE, 2AWQ, 2ACD, 2EO, 2YC, 2FC, 2ABB, 2YB, 2AOJ, 2JX, 2AVK, 2AXZ, 2AOR, 2XY, 2AUH, 2FM, 2AVK, 2AXZ, 2AOR, 2XY, 2AUH, 2FM, 2AHA, 2DG, 2ANA, 2APX, 2AMQ, 2AEF, 2AEZ, 2AJ, 2AML, 2ZW, 2ACU, 2ABU, 2ANU, 2VU, 2KG, 2FU, 2YL, 2FZ, 2AJM, 2VQ, 2ID, 2AZN, 2NG, 2YK, 3YM, 2TT, 2AH, 2CE, 2AFQ, 2HO, 2AJZ, 2AAJ, 2AGD, 2SF, 2AET, 2AGO, 2AZ, 2AGW, 2ACT, 2GR, 2CS, 2VY, David Hay, Bern Taylor, Ron Rudkin, Barry Rudkin, Cee Cronin, Albol Green, 2AGC, 2AG halgh, Harry Cunningham, Richard Re-tallick, Norm Moody, Mr. Bailey, Mr. James, Norm Burton, XYLS, YLS, and children, all making a very satisfactory

The morning session was devoted to general ragchew and registration, when all really got to know one another and many old friends met again in person and recalled the old times and pos sibly some of the old timers. Jim 2YC our President, made the Sunday morn-ing broadcast from 2KR, who incidentally, has moved from his old location, is now the other side of the back fence

Following lunch, the arrival of "Admiral Issacs" and his Petty Officer, 2ABO and Alf, together with Greg 2ANP and Ian 2JI, was witnessed, the group having sailed by dead reckoning and rule of Thrum into the waterside wonderland, from Port Jackson. Their departure a half hour later was in humourous vein, and was a welcome visit to the Field Day. The weather had been quite poor, high winds and high seas, but their return trip was made without event.

.Children's events were organised by 2YB and 2AOJ, the 144 Mc. tx Hunt organised by 2EO, and others were run, and the ladies' competitions at the hall were well supervised by 2YC and 2ACI Raffles run during the day were handled by Ruth, Mrs. 2YC, and Val. Mrs. 2EL. organised the pick-the-valves competi-

Following an afternoon full of activity afternoon tea was taken by most as sembled and various types of refresh ment were obtainable, ice creams and drinks for the kiddies, tea for the ladies and a familiar brown fluid for the

The thanks of the Council go out to those who so willingly assisted to make the day a success: Bill 2HZ, Registration Officer: Ces 2KR, John 2GA, and Major 2RU, for their local organisation par-ticularly; Mrs. Hardman, whose work in the kitchen is always a feature; Mrs. Corbin and Mrs. Bourke; Dave 2EO on the Tx Hunt; 2AOJ and 2YB on the Sports; Rod 2ACU in the back room; 2ASW, 2AAB, assisting with the registration; and 2AWQ and 2EL on the lucky dip; 2AEZ for the tape.

The prizegiving was conducted by the President, Jim 2YC, and the followthe President, Jim 2YC, and the follow-ing were awarded to the fortunate re-cipients: Ladies' Lucky Number: 1st, Mrs. Harvey (2ACI): 2nd, Mrs. Whiting (2ACD); 3rd, Mrs. Storer (2GR); 4th, Krs. Bourke (2EL). Musical Quiz: List, Mrs. Boyd (2AML); 2nd, Miss Quinten (2AZN). Pushing the Penny: 1st, Mrs. Swain (2CS); 2nd, Mrs. Smith (2AEL). 144 Mc. Tx Hunt: The tx was located at Saratoga and was not found, but the prize was awarded to ZAET and ZVU (Singleton). All Band Scramble: Har-old ZAHA. Guess the Valves: 1st, Ken ZKG; 2nd, Harold ZAHA. Morse Test: 1st, Jim 2ZC; 2nd, Ken ZKG. Gents' Lucky Number: 1st, 2DG; 2nd, 2AGO. Pick the Voices: 1st, Ted 2ACD; 2nd, Mrs. Hay (2AGW).

Further lucky numbers were drawn

and 60 members received prizes of valves, the President getting his number drawn only to get a cracked valve. Special prizes were drawn and were won by 2XO, 2ASE, Mrs. 2YC, 2EL and

BOOK REVIEW

RADIO CALLS OF THE WORLD Published by the N.Z. DX Radio Asso-

ciation, 80 pages, Aust. price 4/9.

This is a list of 6,000 medium wave and 2,500 short wave broadcasting stations giving frequency, call sign, location and power. It is a handy little book to have around. On looking through it one finds that the short wave stations ex-tend from 2.33 Mc. to 26.08 Mc., that YVLG is on 3.512 Mc., EQO on 3.797 Mc., a lot of stations in the 40 metre band, none in the 20 and 15 metre bands. Did you know that KCHS on 1400 Kc. is located at Truth or Consequences, New Mexico? Fascinating! One obvious omission is the long wave

broadcasting band. For completeness, I feel sure space could be found in future editions for these 17 stations lying be-tween 155 Kc, and 281 Kc,-A.K.H.

PHILIPS TECHNICAL REVIEW AND PHILIPS COMMUNICATION NEWS

These two journals contain much of interest to the technically minded Amateur. In them will be found descriptions of the latest advances in communications as developed in the Philips Laboratories. In the copies on hand are found articles on carrier telephone systhe international exchange of terns. television programmes and the methods of changing from one set of standards to another, an instrument for measuring transmission times to 0.000,000,001 of a second, and the new photo flux flash bulbs

Subscriptions for these journals should be sent to Messrs. Philips Electrical Industries of Australia Pty. Ltd., Philips House, 69-73 Clarence St., Sydney.—

CALL SICNS

It has been noted with concern that there has been a growing tendency during recent months for licensees of Amateur Stations. narticularly when engaged in telephony transmissions, to omit the station call signs. Such practice is

Such practice is, of course, not in accordance with International requirements, and contravenes the Wireless Telegraphy Regulations under which stations operate. Regulation 60 states that the licensee of an Amateur Station shall at all times transmit the full call sign allotted to the station concerned.

DX C.C. LISTING PRONE

VKSBZ			
	3 168	VK4WJ	17 122
VK5RU .	. 2 165		
		VK4DO	
VK4FJ .	. 21 164	VK4JP	8 114 1
VKSEE .	_ 10 163	VICEMS	
VK3JD .	. 1 155	VK4CB	28 109
VK4KS	9 182	VKIWM	29 109
		VK3HO	25 103
VK6KW			
VKSATN	26 145	VK2ADT	13 102
VK3LN	. 11 141	VKSAHA	15 102
VKJAWW		VKSPJ	
			19 101
VICIJE	7 139	VK3IG	8 100
		VKSQQ	
VK4WF .			18 100
VK4RW	. 23 135	VKSLC	27 100
VK6DD .	6 125	VKSAUP	30 100
		.W.	
Cnll	No. Ctr.	Call	
			No. Ctr.
VKIBZ .	6 314		31 134
VKIKB .	10 200		11 125
	. 8 198		
	8 198	VKSHT	37 134
VKMPH	. 15 191	VK3YD	27 133
VK4FJ .			3 122
VK4EL			
	. 9 175		25 118
WKSBY	45 172	VK3JI	25 118
VK5BY .	45 172	VK3JI	28 117
VK2EO	45 172 2 170	VKSPL	38 117
VK2EO VK3CX	_ 26 168	VICZOY	- 38 117 - 13 116
VK2EO VK3CX	- 26 168	VK2OY	- 38 117 - 13 116
VK2EO VK3CX VK5RX	- 26 168	VK2OY	- 38 117 - 18 116 - 44 115 - 34 114
VK2EO VK3CX VK5RX VK6RU	- 26 168 - 23 159 - 18 155	VK2OY	- 38 117 - 13 116 - 44 115 - 34 114 - 7 113
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VK2ADE

VKZAHA

ANNUAL STATE CONVENTION OF THE VIC. DIV. W.I.A.

Under ideal weather conditions, the Annual Convention of the Division was held at Bullarat on the week-end of opened with a general assembly at the shack of SAMH, which is a brand new points of Ballarat being, 1700 feet show see level. After all had received their commodation, preparations were made excommodation, preparations were made exceeded to the meable of the show the same commodation, preparations were made excellent repart, but before all could do justice to the meal, the ladies and dispute to the meal, the ladies and the same as to make corn for the "Old man."

owing to the seating accommodation being overtaxed. The usual toasts were honored and received.

nonzero and received.

nonzero del the Convention

got away to a good start, there being
25 items, which meant a long sitting.
26 items which meant a long sitting.
26 items of the convention of the part
smoothly. The debates were well spoken
and the outcome of the business will be

North East Zone and the President of
the Division called on the President of
the treat being that the tropby will be
the result being that the tropby will be
in due course At 11.15 pm. the President of
and the Convention, then the
findles, having returned from the picadent closed the Convention, then the
faciles, having returned from the pica-

tures, ounced with the "O.M's." at supper. Members were most delighted to welcome the President of the WKB Division dent Charlle ZAWQ, Hon. Secretary Harry ZACH, and Council member Vince ZVC. Other VKB members and visitors were: Chas. Godden and Prank Uthary Could be a second to the Charles of the Council member vince Colley, from Transigon; Keth Scott, Maffra; Neil Hamilton, from Coleraine; from Wangaratis; Clyde

Case, travelling from Birchip, unfortunately for him his car broke down at Stawell and he could not proceed to Ballarat.

Some of the highlights were: Bob 3IC came equipped with tx hunting gear on his motor bike; some wag named him "The man from Mars." Jack's (3V2) rx broke down just as he was on the hidden tx hunt. On Suday morning, more than half of the gathering developed hay lever. The most disappointed man at the Convention was Frank 3OF, owing to the fact that the six

metre band was not open.

After the demonstrations and talk, there should be many more converts to mobile equipment. It is understood that so the control of the control of

Scramble. In summing up, the Convention was an unqualified success, thereby proving the policy of running them in the country centres. Special praise goes to Bill Sadler and members of the South Western Zone.

Western Scotter. The social side of the Convention opened with all hands at the shack of 3AMH. More car loads the shack of 3AMH. More car loads to visitors arrived for the day's doings and the shack of 3AMH. More car loads to the shack of 3AMH. More car loads to the shack of 3AMH. More car loads to the shack of the

After lunch, the assembly point was the Botanical Gardens, one of the show places of Victoria. Here things really good going, minerous cars were equipped good going, minerous cars were equipped with one station at a time, 10 minutes with one station at a time, 10 minutes as possible on any band. A treasure hum for the children resulted in much hum for the children resulted in much hum for the children resulted in much account and the state of the control of the contr

It would be an idea if a "Get Together" with other Divisions could be arranged at some suitable time and place, as it seems that a closer liaison could be a distinct advantage to all members of the W.I.A.



START THE NEW YEAR RIGHT

- ★ LET SAFETY FIRST BE YOUR MOTTO.
- * STAMP OUT THOSE CAMP FIRES.
- * OBSERVE CARE IN HANDLING HIGH TEN-SION.
- * DRIVE SAFELY.
- ★ DON'T NEGLECT THE XYL.

(Avoid the Dog House.)

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Phone: BY 3774



Tap on to the B+ line just before the r.f. gain control. The 3,000 ohm potentiometer can be mounted next to the meter for the zero level may vary from band to band. The 10,000 ohm potentiometer can be mounted anywhere.

The negative side of the meter goes to the cathode of a tube controlled by a.v.c.

These values work on the writer's BC348. They may not on yours, so be careful as meters are easily damaged. When you have the meter working right, you will have an S meter that works like a charm and does not over swing on those local signals.

Simple S Meter BY LES ELIASON,* VK3ALE

There are many shd varied circuits for S meters and here is another to add to your receiver. There are two adjustments for correctly setting the needle

deflection and zero set.

With this circuit it is possible, with
the right equipment, to calibrate the
scale in db to the input of the receiver.

Maximum deflection is controlled by

a 10,000 ohm wire wound potentiometer and zero set is controlled by a 3,000 ohm potentiometer. Some experiment may be needed to get the right voltage balance across the

get the right voltage balance across the meter.

For c.w. reception the meter should be isolated from the circuit by opening

be isolated from the circuit by opening both leads to the meter.

The circuit values are the ones in use in a BC348 receiver. With suitable modification of values, this circuit can be used with any type of receiver.

* 72 Orr Street, Shepparton, Victoria.

Amateur Radio, January, 1955

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niniature POTENTIOMETERS MORE THAN HALF of all radio and T.V. sets manufactured U.K. Ministure in size-instrument quality at LOW PRICES!

- verall diameter, 1-1/8 inch.
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- steel rotor for shielding and steel shaft for accuracy. OUBLE CLENCH TERMINALS eliminate noisy joints.
- track design for switch and non-switch type enables

- type V switch can be relied upon to handle I amps. 240 volts if amps. 18 volts D.C. for 30,000 operations. Switch pots incorporate a 2 amp, switch,

L. H. MAGRATH & CO. LITE. 208 Little Lonsdale Street, MELB. FB 3731

DX COUNTRIES OF THE WORLD

(MD5) SU Eire (Irish Free State) El

16, ET2, MI3

VR2

OH

P7

HH

TF

The list of Countries as hereunder, and as amended from time to time in Federal Notes, is the Official List to be used in connection with the issue of the Australian DX C.C. Award. The list below shows first the Country, the Zone number in parenthesis (as used by the "CQ" W.A.Z. Award) and the Amafeur Prefix.

Aden & Socotra Is. (21) VS9 YA KL7 Afghanistan (21) Alaska (1) Albania (15) Aldabra Islands (39) Algeria (33) Algeria (33) Andaman & Nicobar Is. VU5 (26) PX, 7B4 Andorra (14) Anglo-Egypt Sudan (34) ST Angola (36) Antarctica (13, 29, 30)
VK1, CE7, LU,
Argentina (13)
Ascension Island (36)

Australia (inc. Tas.) (29, 30) 30) VK Austria (15) (MB9) OE Azores Islands (14) Bahama Islands (8) Bahrein Island (21) M Baker, Howeland & Am

MP4B Phoenix Is. (31) Balearic Islands (14) KRA Barbados (8) Basutoland (38) Bechuanaland (38) Belgian Congo (36) Belgium (14) Bermuda Islands (5) Bhutan (22) Bolovia (10) Bon,n & Volcano Is. (Iwo Jima) (27) Borneo, Brit Nth. (28) ZC5 Borneo, Netherl'ds (28) PK5

Brazil (11) Brunel (28) Bulgaria (20) Burma (26) Canada (2, 3, 4, 5) VE. VO Canada (2, 3, 4, 5) Canal Zone (7) ... Canary Islands (33) Cape Verde Is. (35)

Caroline Islands (27) Cayman Islands (8) Celebes & Molucca Is. (28) Ceylon (22) VS7 Chagos Islands (39) VQ8 Channel Islands (14) Chile (12) China (23, 24) Christmas Is (29) Clipperton Is. (7) ZC3 Cocos Island (7)

Cocos Islands (29) VK1, Colombia (9) Comoro Islands (39) FB8 Cook Islands (32) ZKI Corsica (15) Costa Rica (7) Crete (20) Cuba (8) CM. CO Cyprus (20) (MD7) ZC4 Czechoslovakia (15)

Denmark (14) Dodecanese Is. (Rhodes) (20) Dominican Republic (8) HI Easter Island (12) Ecuador (10) HC Farroes, The (14) OY Falkland Islands (13) VP8 Fanning Is., Wash'ton Is. Christmas Is. (31) Fiji Islands (32) .. Finland (15) Formosa (24)

Egypt (34)

England (14) Eritres (37)

Ethiopia (37)

Formosa (24)
France (14)
French Equa. Africa (36) FQ
French Indo-China (26) FI
French Oceania (Tabiti) FO
French West Africa (35) FF Fridtjof Nansen Land (Franz Josef Land) (40)

Galapagos Is. (10) (HC8) Gambia (35) Germany (14, 15) DJ, DL, DM Gibraltar (14) Gilbert, Ellice & Ocean
Is. (31) VR1
Goa (Portu. India) (22) CR8

Gold Coast (and British Togoland) (35) Greece (20) Greenland (40) ox Guadeloupe (8) Guantanamo Bay (8) Guatemala (7) Guiana, British (9) Guiana, French, and Inini (9)

Guiana, Netherlands (Sur inam) (9) Guinea, Portugese (35) Guinea, Spanish (35) CR5 EA0 Haiti (8) Hawatian Islands (31) KH6 Heard Island (39)

Honduras (7) Honduras, British (7) Hong Kong (24) Hungary (15) Iceland (40) Ifni (33) India (22) Iran (21)

Iraq (21) (Rule Freland Northern (14) (MD6) Ireland, Northern Isle of Man (14) Israel (20) Italy (15) ... 4X4 Jamaica (8) WPS Jan Mayen Is. (40) LA, LB Janan (25) KA, JA

and Palmyra Is. Jarvis (31 Java (28) Johnston Island (31) KJE Kenya (37) Kerguelon Is. (39)

Korea (25) Laccadive Is. (22) 37174 Lebanon (20) Leeward Is. (8) OD5, AR8 Liberia (35) EL Libya (34) 5A1, 5A2, 5A3, (MC1, MD1, MD2, MT2) 5A2,

Liechtenstein (14) Luxembourg (14) CRS Macau (24) Macquarie Is. (30) VKI Madagascar (39) Madiera Is. (33) CS3, Malaya (28) Maldive Islands (22) Malta (15) Manchuria (24) .. C9 Marianas Is. (Guam) KG6

VQ

(27) Marion Is (and Prince Edward Is.) (38) Marshall Islands (31) Martinique (8) Mauritius (39) . .. XE, Az KM6 Mexico (6) Midway Island (31) Miquelon and St. Pierre

Is. (5) Monsco (14) 3A1. 3A2 Mongolian Rep. (Outer) (23) Morocco, French (33)

Morocco, Spanish (33) Mozambique (37) Nepal (22) . NE1, VU? Netherlands (14) PA, PI Nether, West Indies (9) PJ New Caledonia (32) New Guinea, Nether (28) PK7. JZ

New Guinea, Territory of (28) New Hebrides (32) New Zealand (32) Nicaragua (7) Nigeria (35, 36) Niue (32) Norfolk Island (82)

Norway (14) Nyasaland (37) ZD6 Oman, Sultanate (21) Oman, Trucial (21) VS Pakistan (22) Palau (Pelew) Is. (27) KC6 Palestine (20) ZC6, ZC6

Palestine (20) Panama (7) Papua Territory (28) VKS Paraguay (11) Peru (10) Philippine Islands (27) Pricairn Island (32) VR Poland (15) Portugal (14)

Principe and Sao Thome Is. (36) CRS Puerto Rico (8) Ostar (21) MP4C FR Reunion Island (39)

Rhodesia, North. (36) Rhodesia, South. (38) Rio de Oro (33) Rumania (20) Ryukyu Is. (Okin.) (25) KR6 Saarland (15)

ZD

St Helena (38) St Paul & New Amsterdam Is. (39) ... Salvador (7) Samoa, American (32) KS6 Samoa, Western (32) ZM

San Andres and Providenia Archipelego San Marino (15) Sarawak (28) Sardinia (15)

Saudi Arabia (Hebiaz & Nejd) (21) Scotland (14) Seychelles (39) Siam (26) Sierre Leone (35) Sikkim (22) AC3
Singapore (28) VS1
Solomon Is. (28) VR1
Somalliand, Brit. (37) VQ6
Somalliand, Brit. (37) VQ6
Somalliand, French (37) FL
Som'land, Ital. (37) MD4, 15
South Georgia (13) VR8
South Orkney Is. (13) VR8
South Sandwich Is. (13) VR8
South Sandwich Is. (13) VR8
South Sandwich Is. (13) VR8 Sikkim (22) South Shetland Is. (13) VP8 Southwest Africa (38) ZS3 Soviet Union

Europ. R.S.F.S.R. (15, 16, 17) UA1, 2, 3, Asiatic R.S.F.S.R. (17, UA9. 18, 19, 25) Ukraine (16) Belorus'n S.S.R. (18) UC2 Azerbaijan (21) Georgia (21) Armenia (21) Turkoman (17) TIGE UHS Uzbek (17) Tadzhik (1 UI8

TIME

UNI

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EA

KS4

Tadzhik (17) Kazakh (17) Kirghiz (17) Karelo-Finnish Republic (16) Moldavia (16) Lithusnia (15)

Latvia (15) Estonia (15) ... Spain (14) Sumatra (28) Svalbard (Spitzbergen)

(40) Swan Island (7) Swaziland (38) Sweden (14) Switzerland (14) Syria (20) Tanganyika Ter. (37) VQ3

Tangier Zone (33) EK, KT1, Tannu Tuva 1992
Tibet (23)
AC4
Timor Portugese (28) CR10
Togoland, French (35) FD
Tokelau (Union) Is. (31)
Tonga (Friend.) Is. (32) VR5
Transjordan (20) ZCI, JY
Transjordan (20) ZCI, JY
AG2, MF2 Tannu Tuva Rep. (23) Trieste (15) AG2, Trinidad & Tobaga (9) Tristan da Cunba and Gough Is. (38) Tunisia (33) (FT) 3V8

Turkey (20) TA Turks & Caicos Is. (8) VP5 United States of America (8, 4, 5) WN, K, Uruguay (13) CX Vatican City State (15) HV

Venezuela (9) Virgin Islands (8) KV4 Wake Island (31) KWe Wales (14) Wallis Island (32) Windward Is. (8, 9) Wrangel Island (19) Yemen (21) Yugoslavia (15) YT, YU Zanzibar (37)

OZ

FIFTY MEGACYCLES AND ABOVE

50 Mc. FROM MACQUARIE ISLAND

Macquarie Island boys will be taking six metre gear with them. Look for them on 50.94 Mc. Operation is expected to commence early in January.

The November meeting of the Vist. Group was again well attended. The lecture for the was again well attended. The lecture for the who at very short notice replaced Mr. Falling who became ill, within hours of the on condense menutacturing problems. This time dealing with the design, manufacturing Many interesting points were discussed, and those present learnt something of the problems. The Attract for November was a hidden to

The control of the co

chief with his extended until all and the second of the se

and 320.

On the technical ide of the activities, Interest to being shown in Skeleton Bid Antennae. Doo SNO has constructed attack and the show a state of the show and the show a state of the show a state o

Where on 100 and Acres are considerable we will be a sea of the se

After some very determy conditions, the worst, was of a rive bridge are core seen as an after the foods of the province received a contract of the province of

outputs near Lake wencourse. He also heard other unideculfied carriers from the Ballarst area. 3ALW was portable at Black Hill just outside Ballarst for most of the afternoon and worked all of the mobiles and 3ZL.

SOUTH AUSTRALIA

The 8 mx band has been once this month of
The 8 mx band has been once the month of
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AUSTRALIAN V.H.F. RECORDS TWO-WAY WORK

It is in the interests of all vh.f. enthusiasis to notify F.E. through Divisions, if you can betier the above figures. Plesse give exact details of both stations' locations for checking, when submitting your records.

the exhibitation waters. A couple of a skill and the second of the secon

All the best to the household for 1988—1981.

M. C. DUT "and findbull" which have depresented by the second product of the second pr Den SDW (120 miles) were sful, but QSB proves very I wonder what that path to be like if the Dzrling Sca...) wasn't in the way?—4HK



SHORT WAVE LISTENERS' SECTION'

Helio choo! Well throne are notices up. New Street, when the work of the street, which was a street, which was a street, and the street, and the street, which was a street, and the world was a street, and the s

VK3 S.W.I. MENTING
The members of the VK3 Division S.w.I
Group met in the club rooms, 191 Queen Street, et al 305 EST. Among those present were Len
1305 EST. Among those present were Len
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1306 EST. Among those present were len
1306 EST. Among the length of the
1306 EST. Among the
1306 EST. A VK3 S.W.L. MEETING

the garg Meeting Dates for the first term of 1865 will be at 8 p.m. as follows January—Tuesday, 20th, Sherimy—Tuesday, 2ndt; March—Tuesday, 2ndt, 2ndt—March—Tuesday, 2ndt—March—Tuesday, 2ndt—March—Tuesday, 2ndt—March—Tuesday, 2ndt—March—Tuesday, 2ndt—March—Tuesday, 2ndt—Tuesday, 2n

K.W.L. CONTEST Open To All Sw.l's. Throughout VK.

Phone: FL 1203

QLD : Chandlers Pty. Ltd.

VIC.: J. H. Magrath & Co. Pty. Ltd., Healings Ltd., Radio Partz Pty. Ltd., Healings Pty Ltd.

: John Martto Pty. Ltd., University Graham Instruments Pty. Ltd.

Discussion also took place regarding our first Contest, which is to be held from 1st January The Contest will take the following form Contest time will be between 6001 GMT, 1st January 1855, and will close at 2399 GMT on John Wilson, 37 Reyment St., Alphington, Vic.

30th March Clasing dote for receipt of QSLs will be last mail to arrive on the day of 30th June. Results will be made ovaliable over 3WI on Sunday. 10th July at 1130 hours and will be published in "A.R." for the month of August

There will be four sections in which you will be able to enter Section One—Lorgest number of QSLs received from Amsteur Stations throughout the world and dated between 1st January and 20th

March, 1853

Section Two.—Largest number of QNLs reSection Two.—Largest Bloom Wave bands
between 2 and 30 Mc.

Section Two.—Largest number of QNLs reSection Two.—Largest number of QNLs resection Fires Largest number of QNLs resection Fires Largest number of QNLs resection Fires Largest number of QNLs reof Warman and Sections conducted in the form
of Warman and Sections conducted in the form
of Warman and Sections conducted to the section of the section of

Section. QSLs may be in the form of cards of letters of verification. issiers or verification.

The Centest is open to all Swl's throughout
Amatralia and overseas.

If you intend to enter, send your name and
QTH to the Contest Committee 'Swl' Groups,
WIA Rooms, 191 Queen St. Melbourne, C1.

NEWS ON THE AMATEUR BANDS THE AMATEK HANDS

I Me. News of this band over the past
weeks proves quite good. From Frank Nolan
and Jeff Morris, the following reports are to
hand KHEZA, KHEAVH, KHEAVQ—all at SS
signals, W2AC M ARS stations beard were
AISAO, AISAH, AIEAA, AIZAA plus many ZLs
from ST to SS signals. ST to S3 signals.

We Over the last few weeks 25 rix has excellent between 1200 and 15s0 GMT to at 15th Last Carlotte Karr KAZAK JASCA WY, KAZAZ KATJM, KAZYA KHSLAN, KASZB, KHSAXH KOSZB, KHFAF, KRSAZ KATJM, KAZYA KRSAW WINYJ KREOG, KREAQ, WOJYJ ZBEAT ZMEAP ZMEAR VKIAC OAZA. O. IIBUA GM8MM KW8WB. OASG. HC2JR IISM CTICL. CTIFY MI GM9AA FKELL B CESPV. CESCC. OEISJM OEISJM YVSEV

WHATE COUNTY AND THE STATE OF T

RECARCAST SHOPT WAVE DANNE

READACAST HORT WAYE BANDS
From Gerrard Laws Reported From USA
to RCEDI to operating as \$10 Me. with an \$5
50 Me. with a \$5
50 Me. with a \$15
50 Me. with a \$ at strength 57-5.

Once again the New Year is with us and I would like to take this opportunity to with all awal?s. everywhere pleasant DX for 1955 and may you all be blessed with a vary happy New Year. 73 to you all.—John Wilson.



Page 12

ling Ltd., Newton McLaren & Electrical Wholesslers Pty. & Goodman Pty, Ltd.

: Nichelsen's Lid., Atkins (W.A.) Ltd., Carlyle Pty, Ltd.

TAS .: W. G. Genders Pty. Ltd.

DX ACTIVITY BY VK3AHH⁺

PROPAGATION REPORT

3.8 Me: The only conditions observed on this band during the month of November wave regular openings to North America (9706-1130s) and sporadic break-throughs from Semik Amer-ica around 0000-0000

les around 0000-00000 horocase in noise was Nat. The measurable properties of several con-ditions on this bend-otherwise procession conditions were again reasonably good Needla service between 000 and 1000 Cealeral and Statis Assertican openings were reported ba-between 1000 and 1000 and sile, rather upon-density, reported by the condition of the con-site of the condition of the condition of the con-ditions of the condition of

14 Me This band showed some regularity in its conditions to Europe, Africa, and Sestiant Asia around 1100-1550s. Communication to North America was possible during sporadic reak-throughs appead over the whole twenty-our hours of the day. Seath and Centres inserties openings prevailed around 0538-

SOON C. Conditions were changeable and pre-marked openious to many continents but sale an entired openious to many continents but sale and entired to the continents of the sale and a second compactively work signal. European copen-ngs were reported between 6000 and 1500-ness were reported between 6000 and 1500-troke through between 2000 and 6400, while he band opened to Africa around 6400-1600. T-SA Mc As was to be expected short-kkip True Mc As was to be expected anort-supponditions can now be mentioned Overseem penings were those to the Facilie Islands, the ar East and North America, reported from pregulated.

NEWS AND NOTES

While the months December and January are seriods of restril summer holidays for most money of the seriod of restril summer holidays for most money of the seriod of the s

No of the Effort of Science.

Welcome bense to the 1954 Masquarie Island
sam and particularly our fullow Hame: Chen
KIAC, Carden VKIOA, and Dave VKIDI!
May 1955 be an especially good year for
KIDC and VKIZM on Masquarie Islands and
KIRA and VKIAVI in Mawasa. MacRebette
KERA, Antaretica. Good luck and bon

was Leady, Astarstics Good lost and box The 18th Marcottes Good lost and the 18th Marcottes Good lo

depictives from Spinory, 13/13/6, constructed for the control of t

QTHS OF INTEREST. OAIA—Box 51, Paresmaye, Peru. CJAR—OARMA, APO 63, C/o. Postmaster, San Francisco, Calif., U.S.A. EASDE—Via EAICA

† Hans J Albrecht, 10 Belgravia Ave., Nox Bills North, E.II, Vic.

North, E.12, Vic.
Call signs and prefixes worked.
E -sero time—G.M.T Amateur Radio, January, 1955

ACTIVITIES

ACTIVITIES

1.5 Me. Chan IAC reports VKs. and here at
ARES this to the log W and LUTES.

1.7 Mc. IAC worked XLUTES,
1.7 Mc. IAC worked XLUTES,
1.7 Mc. IAC WORKED,
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HARRIEN, AUSAGO, HEINER STELL LAREE TITTALE, CHIEF AND C

CHRISTIAN OCCUPANT CAREERS THANKS CONTROL OF THE CHRISTIAN CAREERS CONTROL CAREERS CONT

WHITE A STATE OF THE STATE OF T

Ti 18 Me Up in Queensland, 4EL worked KARKS* KARKC* JAICJ*, KH&AVH* and beard Ws Good short skip conditions were reported by EALJ, 6HI and Jim Etnal.

THACO, MPHHAF, YVSEU, KG4AT OELIWD, HCLLW, HCLMB, MERSIS (1.5 Mc.), JZERF, VEEDKD (1.5 Mc.), (7 Mc.) YLAM YOSRF, ZBIA SAHH (1 Mc.)

Thanks to the Southern California DX Club and their Bulletin WENTR and VXs 1AC, 12M, 2D, 2ARH, ALL, 3HW, 1M A EXR 1PA, 3TE, 3XB 3XO, 3YT, 3ZA 3ACN, 3ADI 3AHC, AKRE 3ALG, 3ANT, 1AXP 4EL, 4RW, 5EN SHI 3KK 5WO, TKM TXW, and aw is BERS 88 and Jim Hunt.

To you all, wherever you may be, a Happy and Prosperous New Year!

FIFTY MEGACYCLES & ABOVE (Continued from Page 10) TARMANIA

184 Me.: Although we have no new develop-ments to recort this month, interest in the most of the month, interest in the now procured for himself a tx and hopes to be on shortly. When operating, this station to be not shortly. When operating, this station heart and Launceston stations. This when the cesion is also building a tx, Ken will being the number of stations operating in Launceston to stations operating in Launceston. the number of stations operating in Lauroseston to five. The, who operated from Mt Arthur recently, expects to make another visit to the mountain in the near future and there is also a possibility that Len will also be able to operate from Flinders intend. If time permits, Interstate stations will be advised of the literary.

selection will be advised of the lithretery.

All Me. The first opening of the session hard as Me. The first opening of the session hard as the selection of th TXW is now operating on this band on \$18 Me. Although Cris is at present only using a dipole antenna, he should be able to give some Enterstate stations a new Taxmanian contact.

PREDICTION CHART FOR JAN., '88



- **★** GOLD PLATED CRYSTALS
- * SILVER PLATED CRYSTALS



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as No. 315 Single Section 40 pF, one end plate, 2 inch square in No. 346 Single Section 12 pF, when and plate 2 inch square at No. 347 Single Section 250 pF, some end plate, 2 inch square at No. 375 Single Section 250 pF, some end plate, 2 inch square at No. 375 Single-State of No. 9pF two end plates, 25 inch square at No. 375 Single-State of No. 9pF two end plates, 25 in the square at No. 375 Single-State of No. 9pF two end plates, 25 in the square at No. 375 Single-State of No. 376 Single

RECEIVING MICRODENSERS

(at. No. 10 Split-Stater 15 x 15 pF at No. 580 Single Section 12.5 pF at No. 131 Single Section 50 pF, (acrewdriver adjusting) at No. 332 Single Section 50 pF, at No. 333 Split-Stater 23 x 25 pF, at No. 333 Split-Stater 23 x 25 pF.

Cal. No 588 Single Section 140 pc. Cal. No 587 Spitterly 18 18 15 pF. Cal. No 588 Single Section 275 ps. Cal. No 588 Single Section 58 pF. Cal. No 738' Single Section 160 pr. ideable and plates, for use in Cal. No 738' Single Section 160 pr. ideable and plates, for use in Cal. No 738' Single Section 160 pr. ideable and plates, for use in

RECEIVING MINIATURE MICRODENSERS

No. 531 ButlerRy 15 x 25 pF., 30 degrees relation 21.
No. 535 SpHt-Stator 23 x 25 pF., 180 degrees relation 25.
No. 533 Single Section 55 pS, 180 degrees relation 25.
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FEDERAL, QSL, and



DIVISIONAL NOTES

PEDERAL.

SEASON'S GREETINGS As the old your closes, and the new year open, Federal Council and Federal Executive wish to offer Sesson? Greetings to all who are connected with the world of Amsteur Radio both within the Institute and without.

both within the featitute and without. The New Year is a time of looking both ways. Back at past achievements and forward to pro-level ones. In this regard it is appropriate to of workers who make our institute the success it is. The Magazine Committee, Pederal Contest Committee, QM. Managers, Correspondents, meaning part in the smooth running of a complex unit. Each and all deserve particular commendation.

Much has been accomplished during 1834 to nake the radio hobby even more interesting, t is with confidence that the Wireless Institute of Australia awaits the developments of 1886.

T.V.L BOOKS

With increased activity in planning for t.v., it is also significant that Amateurs should plan in order to avoid giving interference to this new medium.

Federal Executive has just landed a shipment of Remmington Rand's latest book on t.v.l. This contains data invaluable in overcoming interference and is a splendid addition to the Amatour's technical library

Those members desiring the latest edition are asked to send a letter to the Federal Sectorary, enclosing 7d. In atamps, and a copy will be forwarded.

U.R.F.-V.H.F. DISTANCE RECORDS In another section of the Magazine will be found the first of the v h.L.u.h.f. records. To the formation is sent from Divisions, these will be amended. Members are requisited to notify their Divisional Secretary of outstanding perfect of the control of the cont

FED. CONTEST COMMITTEE

FED. CUNIEST COMMITTEE.
The Circuit Committee and on the Size Maray of the Committee of the Size Maday of the Committee of the Committee were
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hat alludes to a trophy.

Correspondance produces are considered to the considered t

Certificates for all Contents in the past are now in the post and we would appreciate hearing from any Amateuz who still is with-siders he is entitled to. Help us to help you siders he is entitled to. Help us to help you in blas regard, don't winge to your fellow Amateur, winge to usy we have been winged to by experts and we thrive on it. to by experis and we Unive on it.
If was agreed by the Committe that the their through the committee that the their Trophy should boid the trophy for a per-tod of two months each and then return it to meet winner for two months. When this period for the four winners has been completed, but the 10% winner, who will hold it for the full the 16% winner, who will hold it for the full learn of stated in the rules of the Contest. illy and be only too pleased to co-op-us. Incidentally, the four winners show y is to be photographic that erder. In the series, the series of the series of the series of the content of

FEDERAL OSL BUREAU RAY JONES, VERS, MANAGER

BIL Steer, VISIO, at Maron, bad knocked BIL Steer, VISIO, at Maron, bad knocked up with the lactics employed by Amsteur in a few countries. While he is 600 obser sia-a few countries. While he is 600 obser sia-600 cresits, they commence long Cog on the frequency. Early in January most of the per-on the ice wall exploring, lony VKKIT, who is badding the GRI angle for Bill, reports that badding the GRI angle for Bill, reports that have been sunwered by the sister route as they came in, excepting those within artived by air-

song wire see at 133 feet.

Fred Sellens, ZLIMY now 73 years old and
of course retired, spends much time chasing
contacts on 7 and 14 Mc. e.w., but he also
welcomes VK contacts and requests direct QRL
to his new QTE at 4 Plymouth Street, Palmeraton North.

Treb. BERSING commences two motions among from Xmax. 1884, and plans a motor tour of VK2 and VK4 for most of the period. I VKE and VKE for most of the period.

Geoff Warner has been allotted the call sign of VKEAVW, with QTH C/o. OTC. Radio teceiving Centre. Bringelly. N.S.W. Has is ettling in well, but has tons of work on hand, b is giving Amateur Radio a miss for some

Frank Ansez, VESWZ Inov F/8gt, congrells, slates he knocked back a southern position, slates as a southern position of the control of the lorger Frank would like to make DX Cc. before leaving, but says DX is poor and to date has only SI confirmed and not many outstands by now is much nearer the century. He says they have a round up on 7000 Kc. each Sunday morning with eight stations taking part. The J.A.R.L. advise of their decision to issue seven new certificates. All claims must be sent to the Overseas Committee, J.A.R.L., Box 377, Tokyo, accompanied by verifications by res-tance of the committee of the committee of the barned by registered meil with the award. All suthorised bands may be used C.w. or Phone is permissible. Contacts must be with Japanese andonals and yand must date after July 30, 53.

nationals only and nuture date state 410 30; 30. The The tail of the branchitting awards are as our case the number of International reply coupons that must accompany the sward. It is hipped to be a supplied to the state of the special state so that a recommendation will be sufficient for the awardies and thus would be postage and the awardies and thus would be postage and an Asian DX sward, distalls of which will be supplied at a later date.

MAJA. (Worked All Japan Prefectures).— Comtact with all of the 46 prefectures (16 IR.C.) J.C.C. (Japan Century Cities).—Contact with 190 different cities. There are 390 cities in Japan 119 IR.C.).

SILENT KEY-

It is with deep regret that we record the passing of:-Alex. W. Kelly, VK5XO-November, IVAL

W. A. MacGregor, VK9MC.

NEW SOUTH WALES

The Nevember mentions of the Western in distance of American (N. 1974) was held at the tunal venue on 26/11/54, and in the absence of the President, the chair was ably taken by one of the President, the chair was ably taken by the control of the president, the chair was ably taken as Secretary. Visitors welcomed to our minds were WeVVU/MM. Elisanchii Greg 2ANP, and Carlotte and Harry 2A/MI 2And 2ACD. And 2ACD and A very interesting lecture was delivered by VKEDD, John Rooks, who took as his subject Communications as applied to the Sydney Department of Civil Avistion Telecommunica-tion Centre," and he proceeded to illustrate Department of Civil Aviation Telecommunica-tion Centre," and he proceeded to illustrate the progress made in this field here in Au-tralia and to outline the methods of operation at the major airports in this country, leaving all with the thought that Australian Radic Engineers have placed us at the peak of effi-

Low Drift Crystals

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"ACOS" CRYSTAL MICROPHONES and MICROPHONE INSERTS

A Complete Range For Every Purpose

MIC 36



Housed in attractive plastic case, this Microphone is ideal for home recording and public address, etc. Response unexcelled for its size and price. The performance is not affected by vibration, shock or low frequency wind noise. Omni-directional frequency response substantially flat from 30 to 7000 c.p.s. Recommended load resistance not less than 1 megohm dependent on low frequency response. Can be supplied complete with switch and floor stand adaptor as required at a small extra cost.

This omni-directional Microphone is robust in MIC 22 construction, with a pleasing appearance. Vibration, shock or low frequency wind noise will not affect the performance. The low frequency cut-off is dependent on the load resistance. The cutoff is given by the quotation, F = 80 + R, where F = cps., R = megohms. An adaptor (floor mounting) is available at low extra cost.

SPECIFICATION

Output level = -50 db ref. 1 volt/dyne/cm². Output impedance—equivalent to approximately 0.002 uF. (0.8 megohm at 100 cycles). Frequency response-substantially flat from 40

to 6000 c.p.s.

Recommended load resistance—not less than 1 £9/18/6 megohm, dependent on low frequency response.

Designed to meet even the most exacting requirements, this Microphone incorporates the world famous floating crystal sound cell construction. Its special characteristics are that its

fine performance is not affected by vibration or shock. The fidelity is not impaired by low frequency wind noise SPECIFICATION

Recommended load resistance—not less than 1 megohm

Output level —65 db ref. 1 volt/dyne/cm². Frequency response—substantially flat from 30 c.p.s. to 10,000 b.p.s. Directivity—non-directional. Size—21" spherical diameter

Connector-Standard international 3-pin

£24/19/6

MIC 28

Designed to give freedom of movement, this Microphone is small and non-directional.

Housed in a soft moulded rubber case, which gives protection against shock, it is provided with a pin at the rear of the case for pinning to the lapel. SPECIFICATION

Output level-approx. -55 db ref. 1 volt/ dyne/cml Recommended load resistance—5 megohms.

Recommended load resistance—b megomms. Frequency response—level throughout the whole of the audible spectrum. Capacity—0.0015 uF. at 1000 c.p.s. Impedance—100,000 ohms at 1000 c.p.s. Cord—6 ff. shielded cable. Size—1-9/16" wide x 2½" long x §" thick.

MIC 35

The MIC 35, undoubtedly the best value ever offered, is ideal for amateur transmitters, public address, etc. Housed in an attractive die-cast case. it features a high sensitivity and substantially flat characteristics. Provided with a built-in shunt resistance of £2/15/- 2 megohms, it will, when connected to the grid of the input valve, give a substantially flat response from 50 to 5000 c.p.s. SPECIFICATION

Output level: -55 db ref. 1 volt/dvne/rm2. Cable—approx. 4 ft. of co-axial supplied.
Weight—8 ozs. unpacked, 7 ozs. packed.
Dimensions—microphone only 2½" x 2½" x ½" This Microphone has been designed for the high quality public address and home recording field. High sensitivity and flat characteristics are obtained by a specially designed acoustic filter. Housed in an attractive plastic case with an unexcelled response for its size and price. Unaffected by vibration, shock or low frequency wind noise. Omni-directional frequency response substantrally flat from 30 to 7000 c.p.s.

MIC 33



£6/18/6

MICROPHONE



CRYSTAL MICROPHONE INSERTS These inserts are available in varying sizes ranging from as small

as 15/16" square to 1-13/16" round, with various thicknesses from 7/32" to 9/16". Suitable for every purpose such as hearing aids. public address, tape recording, amateur broadcasting, etc., they have responses from 2250 c.p.s. to 3500 c.p.s. at 5 db to 30 db. Insert can be supplied with or without 18 meg, resistor as required.

MIC 32 insert. £2/15/6: all others. £1/19/6

(MIC 32 illustrated)

AMPLION (A'SIA) PTY. LTD. SYDNEY, AUSTRALIA

MICROPHONE INSERTS



(MIC 23 illustrated)

in the methods of handling Aircraft tency in the methods of bandling Aircraft Communication Following the lecture, z vote of thanks was tendered by Mr. Mages and the general appre-ciation of Mr Ruoks' efforts were shown in the usual manuer—1FA.

SYDNEY SUBURBS

There is plainty of activity on most bands were is plainty of activity on most bands were too fairly. ADO is been worker before the fairly of the fairly of

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me a relat occasionally, not mainty sizes
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skelden allot for a pure 2 ms losse in his
to 200, but does not appear to be interested
in 2 ms activity.

VKI MEMBERS VISIT BALLARAT, TIC.
Hon Secretary Harry 12ACP, Vice-President
Charlie 2AWG, President Jim 17C. and Vince
Rallarat. Leaving Sydney at 4.20 pm. on Priday, they breakfasted with the 2EU at Albury.
To the Company of the Company of the Company
Company of the Company
Compa VKI MEMBERS VISIT BALLARAT, VIC. A most enjoyable 24 hours was spent at the VK3 Convention where the VK2 Hon. Sec..

2ACH, met his opposite numbers in VK3 on F.E., and Charlie and Jim renewed friendships, and everybody became up to on W.L.A. affairs of VK2, VK3 and F.E. on W.I.A. affairs of WEZ, VKG and F.E. skeeness of the debates on the items we revealation to the victims, while the organisate could not be engaged. The hospitality is could not be engaged. The hospitality is for the company of the country of th

Nevritie ARCN groke of the good roads to, and the beauties of, Rendigo, so the Chew, was allowed the control of the control of the con-aged to get a giance at 24WGz jealousty Albury At one stage, the Preddent FYC man-aged to get a giance at 24WGz jealousty west of listy, in N.S.W. both as such be was west of listy, in N.S.W. both as such as "things were different" down in YKS and we were "heading" for Albury slight.

Mar Beault a better street to be pretted wirely and there was a period of wey fluines actively before head were disconserved and wirely and the property of 120°L, at Alberty, were affected and was demonstrated how not become the property of 120°L, at Alberty, were affected and was demonstrated how not become the property of 120°L, and the prop Near Benails a short developed in the ignition

for him on our next trip.

Arrived home Monday at 11.30 a.m. for our a m.m. fear, thred and happy—well, some constant, the mental state of the men

SOUTH WESTERN ZONE

Now a server general galactic forms of the second, due to the second galactic forms of the second galac

WUNTER BRANCH

Sospital, but it CK Again are.

At the Wor Year Field Has on \$1.71/164, the head of the present and the second state of the present and the present again curred of a feet state of the prison of the

College, the lecturer will be Angus Rot and the title of his lecture will be Fundamental Aspects of Aerials." The for the February meeting is expected "Plotting the Wave Patterns of Aerials

VICTORIA

The meeting of the VKS Division was held on Wednesday, 1/12/54 at the usual location of Wednesday, 1/12/54 at the usual location that the location of the location of the lamits here present Various properties of the being considered the best form of entertain-ment for a smally night. I wonder how many of the kiddies present had nightmeres that night Didn't sleep so well myself, but then

some remarkered that beat own an electricity of the control of the

proclassifier issi month was very much appreciated appreciated and the hits print, the feetive session will be right on us. Possibly It is now a little lake to with everybody a Merry Kmas, but I'm in nice time to wish one and all a vary Happy Mew Year. May it see an improvement in conditions on the bands and new distance records on the v.h.t bands. SO METRE TRANSMITTER MUNT



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15. 12.5, S. 2.7 and

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* Special HI-Fi Output Type Fins or minus 1 db 30-49,000 c.n.s.

Type 806-15 watts. Prim. 16,000, 3,000 shma P.P. Type 870-6 watis. Prim., 10,000 ohms P.P. Sec.: 2 or 8 shms (for Bola 198X) 15, 12.0, 2, 3.7 and

Type 871-12 watts. Prim: 10,000 shms P.P. Sec.: 2 or 8 shms. Type \$78-12 watts. Prim., 10,000 ohms P.F. Sec: 3.7 or 15 ohms.

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t Ultra Linear—Output Type will power and response all impad. I you bit—12 watts.
7: 8.360 shms p.p. (with screen tage) ec.: 916-5: 2 or 8 shms; 916-15, 2 or 15 shms.



Amsteur Radio, January, 1955

nt and it was very much enjoyed by all a mijority of them at down to a pinule together, sitting on their cay seats on Fround, they formed a huge circle which er tea turned into an 18 Q8O, which could have to the turned into an 18 Q8O, which could work of relations to the superior to the transport of the transpo

Synthetic and and get longether-Mrs. BLN.

NORTH EASTERN 2002.

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EASTERN ZONE

QUEENSLAND

itine, who any supported Den 4GP with all its gear. To those who know of any listener who may be interested in a listeners' section, it is pro-osed to hold a meeting during February with blans of setting up a section here in this

OBITUARY

ALEX KELLY, VESTO

septime to mer, fanne for the feetings of merities of the section of the section

SOUTH AUSTRALIA

good a lover as you, when it is our turn.

Among the welcome visities were the two
Among the welcome visities were the two
Ton STL. Len BOC, and Mr. Coffing. To these
gentlemen we any the usual polacated to see
gentlemen we say the usual polacated to see
evening. Come again sometime, we will be
pleased to see you all. The meeting closed at
well part that lime, but there were several
unofficial meetings being conducted in several
well part that lime, but there were several
unofficial meetings being conducted in several
will still be there next meeting night when
we as to open up the rooms!

species all his time literature to the activities of the American Unrequient to world. His consequence of the American Consequence of the Conseque

WOOMERA RABIO CLUB
The monthly meeting of the Woomers Club
was held to a capacity gathering of members,
rnd after the usual business was disposed of,
a discussion on the club's equipment was held.
Arising from this discussion, it was decided
to revert to the original circuitry of the ty to revert to the original circuitz; of the two-which will facilitie the operation. The maintenant which will facilitie the operation of the maintenant be than accidable for use with any other two-bers of the control of the control of the votable to will be the control of the con-trol of the control of the control of the votable to will be the control of the con-trol of the control of the control of the residence of the control of the control of the wash error time and nothing to do with it, when there were the control of the control of the votable control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the votable control of the control of the con-trol of the c

Influer, Recoulter III was nomer-bed been in the same the same than the same through the art in the same through the same thr

SOUTH EAST AREAS

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SOUTH EAST AREAS

A SOUTH er all, he must still have his share of inset to attend the meetings are set to a tend to the meetings.

I har nothing to report. I still include John these notes are seen month in the hope that I i eventually wear him down and force him the air in sett preservation. So far, no hatcur Radio and, rightly so, with his excel-t score in the R.D. Contest. Erg must pertainly have stuck to that key in earnest to have run up such a high score in the c.w. section. Nice work OM. SMS is another one who has

bold I know that you work to line in booms reason for the mobilery can up you'll div a memory and the second of th

in these days of free education! I close these noise with another of my little collection of the collection of the collection of all and will concluse it somewhat because the collection of the collection in the collection of the

WESTERN AUSTRALIA

Branch and Chairman of the Committee this State, could naturally speak will crity on this subject, and he clarified i-her of points about the Committee's opera-which may have been in doubt in the A vote of thanks was inoved by Rol-in typical style and seconded by Skippe

WS.

The second half of the programme was pro-rided by a lecture from Ted Pearre, ETP, rulled "Level Crossing Flashing Signaia." Ted vertaintly knew his subject and with the aid of diagrams and apparatus. Blustrated how well he safely angle is looked to by modern rail memory of the property of the property of the pro-toring the protonic of the pro-toring the protonic of the protonic of the pro-toring the protonic of the protonic of the pro-toring the protonic of the protonic of the protonic of the pro-toring the protonic of the protonic of the protonic of the pro-toring the protonic of the protonic of the protonic of the pro-toring the protonic of the protonic of the protonic of the pro-toring the protonic of the protonic of the protonic of the pro-toring the protonic of the protonic of the protonic of the pro-toring the protonic of the pr

sarticular.

One of the Division's regular events held again his year was the Annual Flenic. conducted in Sunday. Its November, at the South Perth one. It went off as a free and casty day ence was somewhat disappointing.

ETR returned safely from his holiday trip though the histories of the safe of the sa

commitments, managed a tour of the shade A little mobile work on 50 Me, was include in with 6WG and 6KJ, but the gay in the st war not overworked. I am also informed the Management of the state of the state of the Radioi Where have you been Norm! 6MK Me been heard on 7 Me, with the SNY, using the been heard on 7 Me, with the SNY, using the fer hot spoids! A half wave works a job better from, or have you memories of an earlier effor

The proposed of the proposed o

et Amsteur Television.

Audiging by the DX column last month. 621.

Audiging by the DX column last month. 621.

Audiging by the DX column last month. 621.

annought em on 14 Mc. 6NF has not been side either, and has been very successful with the other side either and has been very successful with the form of the day o

well now's the time to wish everybody the Senson's Greetings. Christmas has come and sone, but the New Year is still young, so let us hope that it will be a prosperous one, and bring lots of choice DX! ----

TASMANIA NORTH WESTERN ZONE

great credit to the members should organise it was received that members should organise search for radio interference with a view to assving it eliminated with the assistance of the P.M.G. in order to clear the district ready for

P.M.C. in order to clear the district yeady for A. the meeting it was noted that two of our members were in houstful. Som TUV has been again early in the New Year, and Murray TiRk, who has post recently taken it. I two of our American Proposed the A.O.C. manaly analysis of the proposed the A.O.C. manaly for the proposed the A.O.C. manaly for the proposed the A.O.C. manaly for the proposed that the proposed that the interest of the proposed that the proposed for the proposed that the proposed that the for the proposed that the proposed that the for extensions to his beam with a view to add-tor elements for 10 and maybe 20 and 10 an

HAMADS

1/- per line, minimum 3/-. Advertisements under this heading will only be accepted from Institute Members who desire is dispose of equipment which it their own perdispose of equipment which it their own perdispose of the month, and remittance must accempany advertisement. Calculation of cost is based on an average of six words a line. Dealers' advertisements not accepted in this column.

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UM2	60	120	200	Ma.	51"	x	41"	x	51"	11	8		£9/17/2
UM3	120	240	250	Ma.	5]"	×	5]"	x	51"	14	8		£12/2/5
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UM4 250 500 400 Ma. 10[" x 6]" x 8]" 41



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